2025

Prompt2System Hackathon @ **Aachen**

Welcome to the Hackathon! It’s fantastic to have you all here. Today, you’re the creative engine behind bold ideas and real innovation. Take this opportunity to experiment, learn from one another, and push boundaries as a team. And remember, mistakes aren’t just allowed, they’re part of the journey!

Let’s make these days inspiring, creative, and above all, fun.

SIEMENS

Usecase

It's a sunny early summer morning. The Austrian Alps are waking up and with them, countless hikers are getting ready to explore the majestic mountains. Mountain rescue teams know, that today might be a busy day and because of that are on standby, as always. The phone rings: A hiker is injured, has lost orientation, and cannot accurately provide their location. Depending on the severity of the injury, every minute counts, yet searching in steep, forested, or foggy terrain is difficult and time-consuming.

The rescue teams face a real challenge:

The exact position of the hiker is often unclear. Traditional rescue teams have to search large areas, often even by helicopter, which not only results in high costs but also impacts the environment. Many hikers even hesitate to call for help, fearing that this will result in a major rescue operation, possibly involving a helicopter. This leads injured people to question "Is my injury really that bad? Maybe I can make it down to the valley myself and go to the hospital afterwards?" As a result, rescue operations are often unnecessarily delayed or not started at all.

Time for a change:

The Mountain Rescue in Tyrol wants a smarter solution. They commission a startup of creative minds to develop a drone rescue system that will support both rescue teams and hikers.

Their Vision:

- When a call for help (doesn't have to be an actual phone call) is received, a drone is launched and uses modern sensors and intelligent software to quickly and accurately locate the injured person.
- There might even be a solution where hikers can share their exact location easily?!
- The system should work reliably even in poor visibility and difficult terrain like wind, fog, etc.
- Because many mountain rescuers are volunteers, and different people might operate the system each day, the solution needs to be simple and easy to use.
- It is essential that the drone can (also) be operated manually.
- The solution must be affordable and cost-effective for both users and operators.

With a drone system like this, searching for injured hikers becomes much faster and cheaper. It saves important resources and makes it easier for people to ask for help. Rescue missions become smarter, more sustainable, and more caring.

Task 1: System Concept & System Model Creation

You and your group are part of the system development team for the "Drone Rescue TEC" startup. Currently, you are in the concept phase of the drone rescue system. To support further development, it is essential to first develop a comprehensive solution concept for the system.

Purpose & Task:

Using a Model Based Systems Engineering (MBSE) approach, your team's task is to

- create a concept for the drone rescue system and then
- put it into a Logical System Architecture model.

STRUCTURE OF YOUR LOGICAL SYSTEM ARCHITECTURE MODEL

- Overall System
- Subsystems: Drone, Mountain Rescuer, Control Device, Hiker, etc.
- Sub-Subsystems: If needed AND only within the drone subsystem.
- Components
- Functions
- Interactions: Material, information, and energy.

IMPORTANT:

Only the "Drone" subsystem needs to be described in more detail using the structure above! For all other subsystems (such as mountain rescuer, hiker, etc.), it is enough to mention the subsystem and note one or more of its functions. A detailed breakdown is not required for these.

WHAT YOU DON'T HAVE TO INCLUDE IN YOUR MODEL:

- Execution details (no step-by-step control logic)
- Reaction to specific events (no event/state diagrams) or Hardware implementation details
- Internal software flows (no code algorithms, loop structures, error-handling branches) etc.

Format:

You are free to choose any tool for creating your System Architecture Model. You can even sketch or draw your architecture by hand! Just make sure your model is easy to understand and visually appealing, so that everyone can quickly understand its structure and key elements.

Submission Details:

- ONE readable visual representation of your System Model (Image file such as .jpg)
- Document naming: "Group_*GroupNumber*_LogicalArchitecture_RIE25"
- Submission Folder: https://www.dropbox.com/request/pGDEmPSpFmwQSNXCIXbh
- Submission Date: Dezember, 2nd 2025 at 8 p.m.
- In case of any changes related to the submission, you will be notified by your hosts!

Additional advice for the System Model:

Assessment Criteria

For the final assessment of your system model, the following criteria will be considered.

CLARITY AND COMPLETENESS OF COMPONENTS:

Make sure all hardware and software components needed for the drone's operation and its mission (functions) are listed and shown clearly.
Examples: sensors, rotors, power supply, control software, etc.

CLARITY AND COMPLETENESS OF INTERACTIONS:

Show all important connections and interfaces between components. This includes flow of materials, energy, and information/data.

CONSISTENCY:

Use the same notation, terminology, symbols, and colors throughout your model. Be consistent in how you present the details.

USABILITY:

Your System Model should be clear and easy to understand, so that everyone, from software engineers and mechanical engineers to managers, can quickly understand its structure and functions.

FINAL ADVICE:

Think of your System Model as your project's blueprint that is shared by everyone. The clearer, more consistent, and user-friendly it is, the more effective it will help further development and teamwork.

Task 2: Pitch

Your Task:

Prepare a concise and compelling 7-minute pitch that presents your overall system solution to the jury. Address the following aspects:

1. PRESENT YOUR SOLUTION'S CORE IDEA

Present your overall system solution, clearly explaining how it addresses the specific needs and challenges faced by mountain rescue team.

2. DEEP DIVE: YOUR SYSTEM ARCHITECTURE MODEL

Describe your system's architecture in more detail using your System Architecture Model from task 1. Focus on the key components, main functions and important interactions.

3. ARTIFICIAL INTELLIGENCE: APPLICATION, STRATEGY AND LESSONS LEARNED

Showcase your use of AI tools and your strategic approach, e.g. by addressing the following questions:

- Where did you apply AI? What tasks benefited from using AI?
- What limits did you encounter? Were there points where AI didn't deliver as expected?
- Which (and how many) tools did you use? What worked best for you for the respective task?
- What advice or key takeaways would you share with an engineer trying to use AI in the early concept phase of System Development.

4. OPTIONAL:

Make a recommendation on where you see the greatest value in using AI in the concept phase of Systems Engineering or for Systems Modelling or even within a System Modeling Tool.

Format:

- There are no specific requirements for the format or file type that you will use for the presentation.
- Please ensure that you can begin your presentation promptly, without lengthy preparation, simply by connecting your device via HDMI.

Submission & Pitch Details:

- Please submit a PDF copy of your initial presentation by December 3rd at 9 a.m. To ensure fairness for all teams, no changes to the original presentation will be permitted after submission.
- Document naming: "Group_*GroupNumber*_Pitch_RIE25"
- Submission Folder: https://www.dropbox.com/request/PPBxWsmOOoi98CD2wBH3
- Pitch start: On the 3rd Dezember at around 9:15 a.m. (7 Minute Pitches each)
- Pitch location: Event Space @Collective Incubator (Exact location will be provided by the hosts)
- Pitch sequence: The order of the pitches on Dezember 3rd is determined by the group number (starting with Group 1 and so on

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Any more questions?

Just talk to your local organizer or any team member—we’re here to help!

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